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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yoshiaki Takahashi

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

WILSON, MICHAEL H

ART UNIT

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1794

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DELIVERY MODE

12/03/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/534,761	Applicant(s) TAKAHASHI ET AL.	
	Examiner MICHAEL WILSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16, 18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16, 18, and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action is in response to Applicant's amendment filed 5 September, 2008, which cancels claims 1-15 and 17, amends claim 16, and adds claims 18 and 19.

Claims 16, 18, and 19 are pending.

2. Applicant's election without traverse of species 3 in the reply filed on 5 September, 2008 is acknowledged.

3. Claims 3-12 and 17 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5 September, 2008. However, given that the nonelected claims have been cancelled, it is noted that the species election is no longer applicable and is thereby withdrawn

4. The rejection of claims 2 and 13-16 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention due to Applicant's cancellation (claims 2, 13-15) and amending (claim 16) of the claims in the amendment filed 5 September, 2008.

5. The rejections under 35 U.S.C. 102(b) of claims 1, 2, 13, and 14 as being anticipated by Watase et al. (Solid-state luminescence and crystal structure of novel gold(I) benzenethiolate complexes.) and claims 1, 2, 13, and 15 as being anticipated by Yam et al. (Molecular design of luminescent dinuclear gold(I) thiolate complexes:

from fundamentals to chemosensing.) are moot due to Applicant's cancelling the rejected claims in the amendment filed 5 September, 2008.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (US 2002/0086180 A1) in view of Kido (US 5,869,199) and Watase (Solid-state luminescence and crystal structure of novel gold(I) benzenethiolate complexes.).

Regarding claims 16 and 18, Seo et al. disclose an organic light emitting device comprising at least one light emitting layer composed of an organic compound between a pair of electrodes [0065]. The light emitting layer contains both hole transporting and electron transporting material as host ([0040]-[0041]), and a luminescent material as a

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dopant, which may be a triplet emitter [0048]. The reference also discloses oxadiazole compounds as suitable electron transporting compounds [0184]. However the reference does not explicitly disclose polyvinylcarbazole (PVK) as the hole transporting compound or a gold complex as the triplet emitter complex.

Kido teaches a similar organic light-emitting device (abstract). The reference teaches PVK as a preferred material for a hole transporting host in a luminescent layer (column 8, lines 22-24). The reference also teaches that PVK has high hole mobility and superior heat resistance (column 8, lines 34-42).

Watase et al. teach luminescent gold complexes (abstract). The reference teaches a gold complex in which represented by instant formula (6) (page 3586, table 1) and is luminescent in the solid state (page 3586, table 1). The complexes taught by Watase et al. have H as R31, R33, R34, and R35; and H, Cl, or methyl as R32, and X^+ is tetrabutylammonium (page 3586, table 1, complexes 1, 5, and 7). Additionally the reference teaches that the complexes have easily tunable emission (last sentence of page 3588 to page 3589 line 2) and are intensely emissive (Watase page 3586, second column, line 7).

It would be obvious to one of ordinary skill in the art at the time of the invention to use PVK, as taught by Kido, with the gold complex of Watase et al. in the device of Seo et al. One of ordinary skill in the art would reasonably expect PVK to be suitable for the hole transporting host in the luminescent layer of Seo et al. given that Kido teaches PVK as a preferred hole transporting host in the luminescent layer. One of ordinary skill in the art would be motivated by a desire to use a material with high hole mobility and

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superior heat resistance. Further one of ordinary skill in the art would reasonably expect the gold complex of Watase et al. to be a suitable light emitting material given that Watase et al. teach the complex as luminescent as a solid at room temperature. One of ordinary skill would be motivated to use the gold complexes of Watase et al. by a desire to use tunable (last sentence of page 3588 to page 3589 line 2) and intensely emissive (Watase page 3586, second column, line 7) complexes.

9. Claims 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (US 2002/0086180 A1) in view of Kido (US 5,869,199) and Jones et al. (Solid state EXAFS and luminescence studies of neutral, dinuclear gold(I) complexes. Gold(I)-gold(I) interactions in the solid state.)).

Regarding claim 16, Seo et al. disclose an organic light emitting device comprising at least one light emitting layer composed of an organic compound between a pair of electrodes [0065]. The light emitting layer contains both hole transporting and electron transporting material as host ([0040]-[0041]), and a luminescent material as a dopant, which may be a triplet emitter [0048]. The reference also discloses oxadiazole compounds as suitable electron transporting compounds [0184]. However the reference does not explicitly disclose polyvinylcarbazole (PVK) as the hole transporting compound or a gold complex as the triplet emitter complex.

Kido teaches a similar organic light-emitting device (abstract). The reference teaches PVK as a preferred material for a hole transporting host in a luminescent layer

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(column 8, lines 22-24). The reference also teaches that PVK has high hole mobility and superior heat resistance (column 8, lines 34-42).

Jones et al. teach luminescent gold complexes (abstract). The reference teaches a gold compound represented by instant formula (7), wherein R41 to R44 are phenyl groups, R51 and R52 are combined to form a propylene group, and Z is an ethylene group (page 1997, figure 1, compound 5). The reference teaches the complexes are luminescent in the solid state and at room temperature (page 1999, second column, fourth paragraph lines 2-3).

It would be obvious to one of ordinary skill in the art at the time of the invention to use PVK, as taught by Kido, with the gold complex of Jones et al. in the device of Seo et al. One of ordinary skill in the art would reasonably expect PVK to be suitable for the hole transporting host in the luminescent layer of Seo et al. given that Kido teaches PVK as a preferred hole transporting host in the luminescent layer. One of ordinary skill in the art would be motivated by a desire to use a material with high hole mobility and superior heat resistance. Further one of ordinary skill in the art would reasonably expect the gold complex of Jones et al. to be a suitable light emitting material given that Jones et al. teach the complex as luminescent as a solid at room temperature. One of ordinary skill would be motivated to use the gold complexes of Jones by a desire to utilize the luminescent properties of those complexes.

Regarding claim 19, modified Seo et al. disclose all the claim limitations as set forth above. The reference discloses Z as ethylene (page 1997, figure 1, compound 5), but does not explicitly disclose Z as methylene. However, ethylene and methylene are

homologs - compounds differing regularly by the successive addition of the same chemical groups, in the present instance, methylene has one less CH₂ group than methylene, and the courts have held, as found in *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977), that compounds which are homologs “are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties”.

In light of the case law cited above, it therefore would have been obvious to one of ordinary skill in the art that the Z of methylene disclosed in the present claims is but an obvious variant of the ethylene disclosed in Jones et al., and thereby one of ordinary skill in the art would have arrived at the claimed invention. Further Jones et al. teach the emission of the complexes to be predominately a S→Au charge transfer state (page 2001, first column, second paragraph lines 1-4), with minimal contribution from the bisphosphine ligand (page 2000, first column line 8 to second column line 4). The reference demonstrates that substituting the phenyl rings on the bisphosphine with cyclohexane does not significantly alter the luminance (page 2000, first column lines 8-11). Therefore one of ordinary skill in the art would expect a complex with Z of methylene to possess similar properties and be suitable for the same purpose.

Response to Arguments

10. Applicant's arguments filed 5 September, 2008 have been fully considered but they are not persuasive.

Applicant argues that an organic light-emitting device must be optimized. However case law holds that optimization of a known device using known materials is within the ordinary skill of the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Also, where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing *KSR v. Teleflex*, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly, applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d at 1518-19 (BPAI, 2007) (citing *KSR*, 127 S.Ct. at 1740, 82 USPQ2d at 1396). Accordingly, since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement.

Applicant also argues that prior to the foreign priority document (JP 2002-331555) filed 15 November 2002 no blue phosphorescent materials were known. However, Watase et al. clearly demonstrates blue gold(I) phosphorescence (page 3586, table 1 and figure 1).

Applicants also argue that none of the references cited easily teach the mechanism of the present invention, i.e. energy supplied to the device can be efficiently converted into light. However, given that Seo et al. in combination with Kido and either Watase or Jones disclose organic light emitting device comprising light emitting layer comprising oxadiazole, PVK, and gold complex as presently claimed, it is clear that the light emitting layer would intrinsically efficiently convert energy supplied to the device into light as does the device of the present invention.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MHW

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794